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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,931	03/01/2004	Takemori Takayama	04005/LH	3234

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EXAMINER	
YEE, DEBORAH	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 06/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,931	TAKAYAMA ET AL.	
	Examiner	Art Unit	
	Deborah Yee	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 3 to 15, 17 to 20 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3 to 15, 17 to 20 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7-28-04 page 1;*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: IDS 3-1-04 page 2
IDS 4-11-06.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 7, 11,12 , 17 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 1, 11, 12, and 17 are indefinite because they recite Cr as an optional element yet the presence of Cr would appear to be mandatory since an average Cr concentration in the cementite of 2.5 to 10% is actively recited.

4. Claim 7 is indefinite because it recites "further containing one or more alloy elements...Cr" yet Cr is already recited as an alloying element in parent claim 1.

5. Claim 19 recites "...cooling at a temperature equal to or lower than the A1 temperature and then to a temperature equal to or higher than the A1 temperature." This is indefinite since cooling from a lower temperature to a higher temperature can't occur.

Double Patenting

6. Claims 1, 3 to 15 , 17 to 20 and 22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 to 12 and 17 to 20 and 22 of copending Application No. 10/790,959. Although the

conflicting claims are not identical, they are not patentably distinct from each other because of the reasons stated in previous office action dated 12/08/05.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 1, 3 to 15,17 to 20 and 22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 to 17 of copending Application No. 11/234,959 or claims 1 to 20 of copending Application No. 11/235425. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a rolling element having a composition with essentially the same alloying constituents in wt% that are overlapping, and have a martensitic microstructure containing soluble carbon, cementite and Cr in cementite, and/or compounds (nitrides, carbides and carbonitrides) in ranges that are encompassing or overlapping. Note that the overlap in range establishes a prima facie case of obviousness since it would be well within the skill of the artisan to select the pending claimed ranges over the claims of application, since similar utility and properties are taught.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 3 to 8 and 17 to 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Monma et al (US Patent 3,663,314)

10. Monma discloses specific bearing steel examples 14 to 19 in Table IV in columns 3-4 which meet the composition and surface layer limitations recited by claim 1. Note examples contain Cr and C within the ranges of 0.45 to 1.5% C and 0.3 to 1.5%Cr recited by claim 1, and have a quench-hardened surface layer tempered at low temperature whereby surface layer contains cementite (designated as C percent in Table IV) within the vol% range of 2 to 18% dispersed in a martensite parent phase and solid-dissolving carbon (designated D in Table IV) within the range of 0.25 to 0.8% recited by claim 1. Even though Cr concentration in cementite at 2.5 to 10 % recited by claim 1 is not taught, such would be expected since composition and process of making limitations are met. See lines 5 to 20 of column 5 wherein steel is subjected to normalizing (heat treat in austenitic range A1 or higher and is equivalent to Cr concentration treatment step recited by claim 18), spheroidize annealing and case hardening by austenitizing, oil quenching and tempering.

11. Monma on line 7 of column 5 discloses mean carbide particle size (cementite) at 0.6 microns which is within the average cementite particle diameter of 0.1 to 1.5 microns recited by claim 3.

12. Although pearlite or retained austenite as recited by claims 4 and 5 respectively are not disclosed by Monma such would be expected since composition and process limitations are met, and in absence of proof to the contrary.

13. Even though a prior austenite grain size of ASTM 10 of higher recited by claim 6 is not taught, such would not be a patentable difference since it is a past rather than a present property.

14. Monma discloses specific bearing steel examples 26 to 32 in Table VII of column 7 containing Si and hence meet claim 7.

15. Monma meets claim 8 because claim recitation only requires Ni when Al is added.

16. In regard to process claims 17 to 19, Monma on lines 5 to 20 of column 5 discloses normalizing (heating at austenitic temperature range and cooling) which is equivalent to applicant's Cr concentrationg treatment step of heating at A1 to 900C followed by cooling, spheroidizing and case hardening by austenitizing, quenching and tempering.

Response to Arguments

17. Applicant's arguments filed 4-11-06 have been fully considered but they are not persuasive. It was argued that Monma steels have a Cr concentration which is rather

high with respect to the carbon concentration. It is therefore expected that the Cr concentration in cementite dispersed in the steel which has been spheroidized is notably high, leading to a problem as discussed in the present specification that satisfactory hardenability is not attained when case-hardening is performed by induction hardening Applicant stated that present invention steel alloy needs to have a Cr wt% amount within the range of 0.55xC to 1.2x C. It is the examiner's position that such equation is not recited by the claims. Moreover, criticality of range has not been established with comparative test data.

18. It was argued that Monma does not disclose a method for determining the appropriateness of the C and Cr concentration to obtain a case-hardened layer with satisfactory hardenability. It is the examiner's position that Monma on lines 5 to 14 in column 5 teaches normalizing which is equivalent to applicant's Cr concentration treatment since the same step of heating at A1 to 900C followed by cooling is performed.

19. It was argued that prior austenite grain size of 10 or more recited by claim 6 is critical to achieve greater hardenability, toughness and strength for martensite. It is the examiner's position that prior austenite grain size of at least 10 is achieved by an intermediate process step to make final product. To distinguish over prior art, applicant will need to show (e.g by comparative data) that final product is different from prior art final product.

20. The Brick et al publication has been cited to disclose the definition of normalizing which is heating steel to the austenitic field (A1) followed by air cooling.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on Monday-Friday from 6:00 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Deborah Yee
Primary Examiner
Art Unit 1742

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